Eurocopter Fleet Safety Department
Aeroport de Marseille Provence
Marignane 13725

November 15, 2010

National Transportation Safety Board
Chairman Deborah Hersman
490 L'Enfant Plaza, SW
Washington, DC 20594

Subject: ANC08FA053

Dear Honorable Deborah A.P. Hersman,

Pursuant to 49 Code of Federal Regulations 845.41, Eurocopter petitions the National Transportation Safety Board to reconsider its findings and determination of probable cause in the accident investigation resulting from the crash of a Eurocopter AS-350-B2 helicopter, which occurred on 15 April 2008, near Chickaloon, Alaska.

49 Code of Federal Regulations 845.41(a) states:

Petitions for reconsideration or modification of the Board's findings and determination of probable cause filed by a party to an investigation or hearing or other person having a direct interest in the accident investigation will be entertained only if based on the discovery of new evidence or on a showing that the Board's findings are erroneous... Petitions based on a claim of erroneous findings shall set forth in detail the grounds relied upon.

Key findings listed in the NTSB Final Report are erroneous, and important technical aspects of the investigation were overlooked or have not been adequately addressed by the NTSB.

Summary of the Accident:

The NTSB conducted a field investigation of this accident. The NTSB Factual Report states, in part:

HISTORY OF FLIGHT

On April 15, 2008, about 0923 Alaska daylight time, a Eurocopter AS-350-B2 helicopter, N213EH, sustained substantial damage during an emergency descent and impact with terrain, about 34 miles east of Chickaloon, Alaska. The helicopter was being operated as a visual flight rules (VFR) cross-country

passenger flight under Title 14, CFR Part 135, when the accident occurred. The helicopter was owned and operated by ERA Helicopters, LLC., Anchorage, Alaska. The commercial pilot and three passengers were killed, and one passenger, the 15-year-old stepson of one of the deceased passengers, sustained serious injuries. Visual meteorological conditions were reported in the area at the time of the accident, and company flight following procedures were in effect. The flight originated at the operator's base in Anchorage about 0742, en route to various communication sites near Chickaloon.

During a telephone conversation with the National Transportation Safety Board (NTSB) investigator-in-charge (IIC) on April 17, the operator's general manager reported that the purpose of the flight was to shuttle State of Alaska telecommunications technicians and equipment between three remote communication sites near Chickaloon. He noted the helicopter departed the Anchorage base with only the pilot aboard. The manager said that the pilot was instructed to land at the State of Alaska's telecommunication heliport in Anchorage to pick up three technicians and their equipment, and then fly to the communication sites near Chickaloon.

During a telephone conversation with the NTSB IIC on April 17, a technician that was aboard the helicopter when it departed from the Anchorage telecommunications facility reported that after departure the crew planned to meet an additional technician at the first of three communication sites to drop off equipment. He said as they approached the first site they realized that the technician they planned to meet was not there, so they continued to the second site. The technician said the helicopter landed at the second site about 0900, and left him there. It was agreed that the helicopter would return by 1300 to pick him up. The technician reported that after the helicopter departed from the second site, and before continuing on to the third site to drop off the two remaining technicians and their equipment, the pilot was to fly to a rest area along the highway, and pick up one other technician that would be waiting with additional equipment to be transported to the third communication site. The technician said he was unaware that the other technician would have his stepson with him.

When the flight failed to return by 1300, the technician contacted the State of Alaska's telecommunications shop, but was told that the other technicians had a lot of work to do, and to give them more time. When the flight still had not returned by 1400, the technician again contacted the State of Alaska's telecommunications shop. As a result, the State notified the operator, who attempted unsuccessfully to contact the helicopter via satellite telephone and aircraft radio. The operator reported the helicopter overdue to the Federal Aviation Administration (FAA) at 1540, and they contacted the Air Force Rescue Coordination Center.

The Air Force Rescue Coordination Center (AFRCC) at Elmendorf Air Force Base, Anchorage, had received the first alert of a signal from a 121.5 MHZ

emergency locator transmitter (ELT) signal at 1121 that day. They were unaware at the time that the accident helicopter had crashed, but were already in the process of organizing a search related to the unknown source of the ELT signal.

Personnel of the Alaska State Troopers, Civil Air Patrol, Alaska Mountain Search and Rescue, and the Alaska Air National Guard, were dispatched to search for the helicopter, but blizzard weather conditions limited search personnel to a ground search until weather conditions improved the next day.

The helicopter's wreckage was located on April 16, about 0750, in an area of hilly, tree-covered terrain, about three-quarters of a mile from the highway rest area where the technician and his stepson were picked up. Additional details of the search and rescue follow in the Search and Rescue section of this report.

During an interview with the NTSB IIC on May 27, the sole survivor of the accident, a 15-year-old juvenile, reported that he was asked to accompany his stepfather, who was a telecommunications technician with the State of Alaska, to the third communication site. The boy said that after the helicopter landed in the parking area of the highway rest stop, the pilot shutdown the helicopter before additional equipment was loaded. He said that before departing from the parking lot, he was placed in the front left seat, and the other three passengers were seated in the aft seats. The juvenile noted that he took with him a small day-pack, which contained a bag lunch and two bottles of water. He did not recall where he placed the day-pack.

Due to injuries sustained in the accident, the juvenile said he was unable to recall many details of the accident.

According to management personnel with ERA Helicopters, and management personnel with the State of Alaska's Telecommunications Division, neither knew that the juvenile was on board the accident helicopter.

On the morning of the accident, a motorist about one mile south, traveling northbound on the highway saw the helicopter lift off from the roadside, and fly in an east south-east direction. The motorist estimated the visibility to be about 2 miles in light snow. He said he saw the helicopter flying below the overcast, and it made a steep descending right turn toward the ground. He said initially he thought the helicopter was going to crash, but as he approached the area where the helicopter departed, he saw the ravine where the helicopter made the descent. The motorist was familiar with helicopter operations from his job working on the Alaska pipeline, and thought the helicopter was probably working in the ravine. He said it was not unusual to see helicopters working along the highway, but he thought the steep descent was unusual, and commented to a friend after arriving at his work site, about the helicopter and the scary ride the pilot must have given the passengers. He said he did not hear about the accident until several days later, and then contacted the IIC.

The National Transportation Safety Board (NTSB) concluded that the probable cause for this accident was:

- The loss of engine power due to an overspeed of the helicopter's turbine engine, precipitated by the inadvertent movement of the fuel flow control lever by the passenger.
- Also causal was the manufacturer's design and placement of the fuel control lever which made it susceptible to accidental contact and movement by passengers.
- Contributing to the accident was the pilot's failure to properly secure/stow the passenger's backpack.
- Likely contributing to the severity of the occupant's injuries was the helicopter operator's failure to properly monitor their satellite flight following system and to immediately institute a search once the system reported the helicopter was overdue.

Technical Facts Leading to this Petition:

During the investigation, the investigation team discussed and researched the possibility and effects of an inadvertent movement of the fuel flow control lever (FFCL) to the emergency range during flight. According to the following physical evidence and information provided by Eurocopter during the investigation, an inadvertent movement of the FFCL to the emergency range during flight is not a possible cause for the accident:

- The engine to main transmission drive shaft was found twisted and shortened (Figure 1), resulting in liberation of the splined (rear) end of the shaft for the engine output; engineering calculations performed by the Eurocopter design office revealed such damage would result from a torque event of at least 300 percent.

Figure 1

- The module 5 drive retaining nut in the engine contains an index mark (Figure 2) which was misaligned approximately seven millimeters as a result of the accident sequence; According to Turbomeca, the engine manufacturer, such misalignment would result from a torque event of approximately 500 percent.

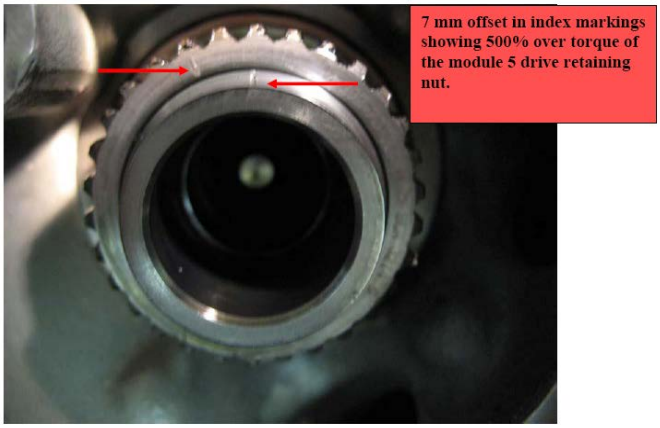


Figure 2

- During normal cruise flight, the movement of the FFCL to the full forward (emergency) position would initially cause an increase in fuel flow to the engine; however, with the fuel control unit (FCU) still functioning and the rotor system loaded (as it would be during flight), the FCU will react immediately, and the maximum fuel flow delivered by the emergency valve to the injection wheel will be 180 liters per hour due to closure of the metering valve.
- The FCU was removed from the accident engine, and bench tested. During the tests the FCU performed normally, within specified parameters.
- The maximum possible emergency valve fuel flow of 180 liters per hour would result in a maximum torque value of 180 to 200 percent with a loaded rotor system, significantly less than the torque evidenced by the main wreckage.
- The FFCL was found bent to the left, detent-side direction, indicating it sustained a significant impact force at some point during the accident sequence. Please see Figure 3 and refer to Appendix 1.

Figure 3

- There is no evidence to prove that the observed position of the FFCL above was the position at the time of the final impact.
- Figure 4 below shows a mark/scratch below the normal lever-detent contact area and deformation of the finger, which indicates that such damage would occur only as the result of a significant force on the FFCL in the detent direction great enough to create a differential movement relative to the quadrant, i.e. during impact.
- In addition, the length of this mark shows that the FFCL lever was not in the full emergency position when the damage occurred, as the distance D1 is equal to the distance D2 and shorter than D3 in Figure 5 (exemplar FFCL), which corresponds to the full emergency position.

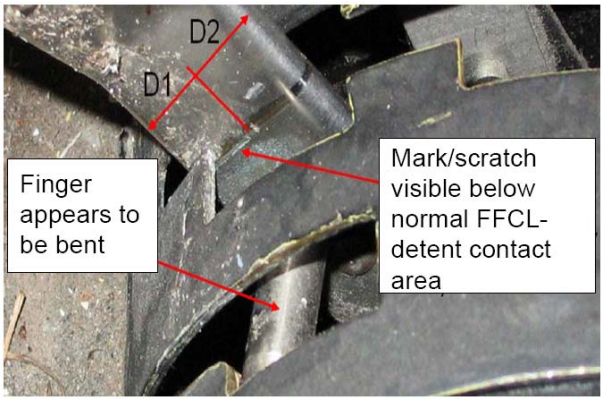


Figure 4

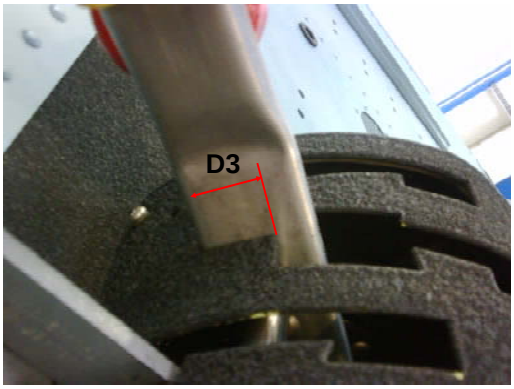


Figure 5

- The damage observed on the FFCL could have resulted from the crash itself; the subsequent location of the FFCL could have been a result of a post crash action by the pilot or survivor, or a result of the wreckage recovery process.

Page 1g of the NTSB Factual Report states, "According to Eurocopter USA's test pilot, the inadvertent placing of the fuel flow control lever in the full forward (emergency) position in cruise flight unbeknown to the pilot would cause an engine over speed within seconds, and potentially result in shedding of the free turbine blades." This statement is incorrect. As reported to the NTSB IIC by the American Eurocopter Party Representative, if the FFCL is moved to the emergency range during flight with a functioning FCU, NR (rotor RPM) will increase slightly, but no engine overspeed will occur because the main rotor is loaded by the flight loads (which vary with main rotor pitch). The only known scenario where an engine overspeed and resulting turbine blade shed could occur with a functioning governor is on the ground with an unloaded main rotor.

The free turbine blades of the engine did shed during the accident sequence. According to the engine manufacturer, free turbine blade shedding occurs by design when the engine exceeds 150 percent NF (free turbine RPM). The turbine blade shedding is a safety measure designed to keep the turbine wheel from becoming unbalanced and coming apart during an engine overspeed. Based on the evidence in the wreckage, it is

most likely that the NF overspeed was caused by the separation of the engine from the main rotor system, which was caused by the twisting/shortening (high torque event) and subsequent liberation of the splined (rear) end of the shaft.

Eurocopter Investigators identified three possible scenarios to explain the high torque event evidenced by the wreckage:

1. Malfunction of the freewheel assembly:
   The freewheel assembly was examined by the investigation team at the manufacturer's facility; no pre-impact anomalies were identified which would have precluded normal operation.

2. Failure or seizure of the main transmission:
   The main transmission rotated freely in both directions following the accident. The main transmission was examined by the investigation team at American Eurocopter, and no pre-impact anomalies were identified which would have precluded normal operation.

3. Main rotor impact during flight:
   The main rotor blades exhibited static puncture damage, chord wise bending, and trailing edge splitting consistent with low to no main rotor RPM on final impact. Two of the three blades came to rest in willow bushes with unbroken branches on both sides. However, the Starflex main rotor hub and red main rotor blade leading edge exhibited damage consistent with a powered impact suggesting a main rotor impact occurred during flight, prior to the final impact. Please refer to Appendix 8.

According to the NTSB Factual Report, the NTSB Investigator in Charge (IIC) and two other investigators returned to the site on June 4, 2008, nearly two months after the accident, to look for evidence of a main rotor blade strike, but found none. While Eurocopter appreciates the effort of the NTSB IIC, it is unlikely that evidence of a main rotor blade strike would remain, as the general accident area was covered in snow at the time of the accident (Figures 6 & 7).

Figure 6

Figure 7

The following physical evidence suggests a main rotor blade strike occurred during flight:

1. Corresponding high-torque damage evidenced by the engine to main gearbox drive shaft and engine module 5 nut.

2. The engine to forward tail rotor drive shaft flex coupling discs were splayed, consistent with power/rotation during misalignment. (The forward tail rotor drive shaft is connected to aft end of the engine. If the engine decouples from the main rotor drive system and continues to run, the engine would continue to drive the tail rotor system.)

3. The splined flex coupling assembly that connects the forward steel tail rotor drive shaft to the aft aluminum tail rotor was disengaged. Rotational scoring was observed on the interior of the driveshaft cowling in the area of the coupling.

4. The tail rotor shaft key sheared inside the tail rotor hub, consistent with a high torque event in the direction of sudden tail rotor drive shaft acceleration when main gearbox drive shaft disengaged (Figure 8).

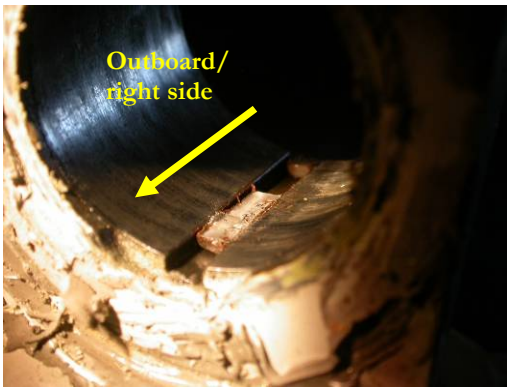


Figure 8

5. The Starflex main rotor hub and red main rotor blade leading edge exhibited damage consistent with a powered impact suggesting a main rotor impact occurred during flight, prior to the final impact; however, there was also damage to the red main rotor blade consistent with a low rpm impact (static punctures and chord-wise bending) at the site. Please see to Figure 9 below and refer to Appendix 8 for additional information.

Main Rotor Blade Damage (outboard/tip, upper surface)

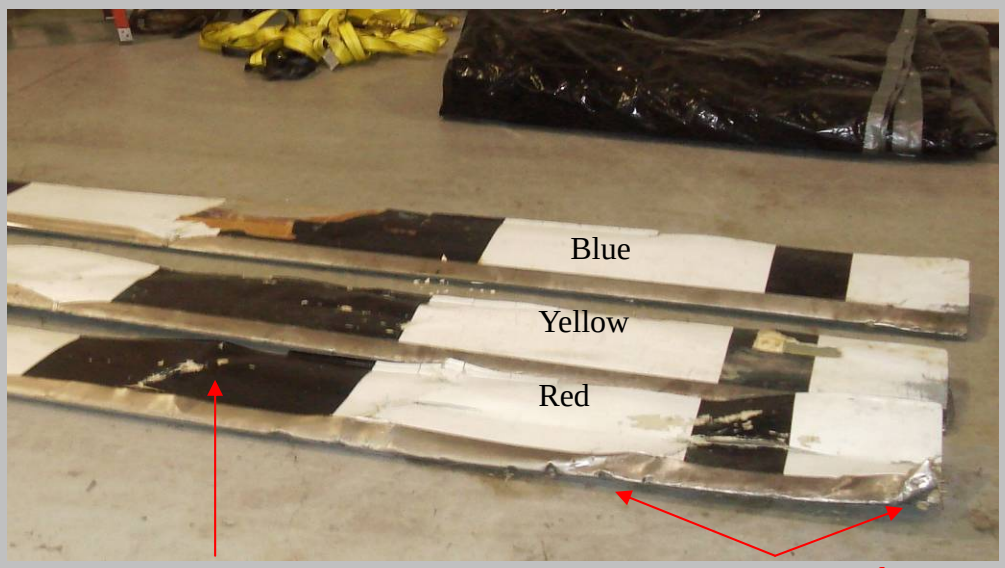


Figure 9

6. Lack of evidence of overall rotation/power at final impact, suggesting the high-torque event occurred during flight.

New Evidence:

Although Eurocopter did not locate any files for incidents/accidents involving an inadvertent movement of the FFCL to the emergency range during flight, Eurocopter did locate a file for an accident involving an intentional movement of the FFCL to the emergency range during flight. This event involved an Aerospatiale/Eurocopter AS350B, S/N 1317 (C-GPTT), on 04 May 2000, near Blanding, Utah. The accident (NTSB # DEN00FA084) was investigated by the NTSB with the technical assistance of Eurocopter and Turbomeca. The accident brief and probable cause are attached as Appendix 7.

The NTSB determined the probable cause of this accident was the loss of aircraft control following an abrupt flight manoeuvre in a high density altitude weather condition. Contributing factors were the high density altitude weather condition, the total loss of engine power due to the pilot manually introducing excessive fuel into the engine and over temping the turbine section, and the lack of suitable terrain for the ensuing autorotation.

The pilot's intentional movement of the FFCL to the emergency range (introducing excessive fuel into the engine) resulted in surging, overtemping the power turbine section, followed by a complete loss of power. The NTSB investigation of the engine and dynamic components revealed:

- First and second stage power turbine blades were 50 to 70 percent melted (Figure 10).
- No blade shedding occurred on the free turbine blades (Figure 11).
- No evidence of an overtorque was found on the Module M05 splined sleeve.
- Engine to MGB coupling shaft did not evidence any sign of torsion.

Figure 10

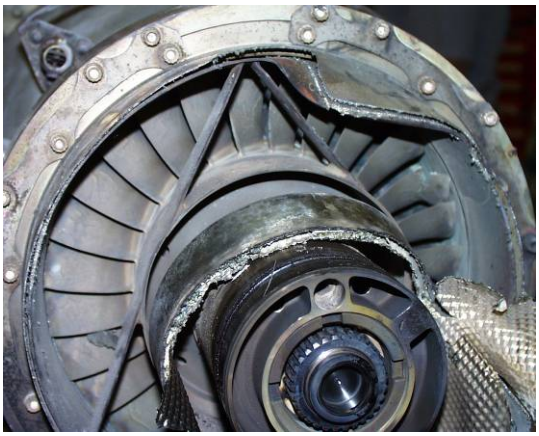


Figure 11

These findings indicate that the additional fuel flow resulting from a movement of the FFCL to the emergency range would result in overtemping to the point of degradation of the power turbine stages. However, a movement of the FFCL to the emergency range would not result in an overtorque or an in flight overspeed of the free turbine assembly consistent with the damage observed on Era Helicopters' AS350B2, S/N 3158. The lack of any engine overspeed damage in the earlier accident involving S/N 1317 with the intentional in-flight movement of the FFCL to the emergency range is substantial evidence that movement of the FFCL was not involved with the engine damage in this accident.

It is also for this reason that Eurocopter and Turbomeca repeatedly requested to examine the engine's power turbine section. To date, this examination has not yet been performed. A confirmed absence of thermal damage to the power turbine blades in this accident would provide further significant evidence that there had been no in-flight movement of the FFCL to the emergency range at any point in the accident sequence.

Correspondence with NTSB IIC during the Investigation:

Throughout the investigation and during the draft factual report review process, Eurocopter provided technical information and expressed its disagreement with the theory that the FFCL had been inadvertently displaced to the emergency range. Many comments and corrections suggested by Eurocopter as part of the draft factual report review process were not included in the final NTSB Factual Report. Please see Appendices 4 & 6.

Party members including Eurocopter requested the examination of the engine to main gearbox drive shaft as well as a teardown and examination of the engine power turbine to search evidence of overheating on the turbine blades. To date, these examinations have not yet been performed.

The weight and balance figures for the time of the accident were never determined during the investigation. The American Eurocopter Party Representative requested pilot and passenger weights to perform calculations, but never received this information. As reported to the investigation group during the wreckage examination, the weight of the helicopter for the accident flight was 4,961 pounds, one pound higher than the certified maximum gross weight for the AS-350-B2.

Page 1g of the NTSB Factual Report states, "According to Eurocopter USA's test pilot, the inadvertent placing of the fuel flow control lever in the full forward (emergency) position in cruise flight unbeknown to the pilot would cause an engine over speed within seconds, and potentially result in shedding of the free turbine blades." This statement is not correct. When the American Eurocopter Party Representative asked the NTSB IIC which "Eurocopter USA test pilot" made this statement, he could not recall. None of the American Eurocopter test pilots recall being contacted by the NSTB IIC during the investigation, nor was the American Eurocopter party representative involved in such correspondence.

AS350 Fleet History and Throttle Quadrant Guard:

AS350 variant helicopters equipped with the floor-mounted fuel flow control lever (FFCL) have accumulated 15 million flying hours worldwide since the helicopter was certified in 1977. As mentioned above, Eurocopter performed a search of its records during the investigation for any incidents or accidents caused by the inadvertent displacement of the FFCL into the emergency range during flight and found no such evidence.

Eurocopter studied and proposed an optional guard to be installed with the Emergency Medical Service (EMS) litter installation, but due to lack of interest by the operators, the guard was withdrawn as an option in 2007**.** It should also be noted that this guard and some other aftermarket guards are not compatible for normal use of the aircraft with two pilots or for training missions. Please see Appendix 2 for additional information.

Conclusions:

Based upon the foregoing, Eurocopter submits there is no evidence to support the Safety Board's probable cause determination that the accident was precipitated by the inadvertent movement of the FFCL lever by the passenger, or that the manufacturer's design and placement of the fuel control lever made it susceptible to accidental contact and movement by passengers. In fact, the physical evidence confirms that such a movement of the fuel control lever could not have been the cause of the accident, and that

a main rotor blade strike is the only cause for this accident that explains all of the physical damage observed throughout the aircraft's dynamic components. Furthermore, Eurocopter submits there is no evidence to support that the pilot failed to properly secure/stow the passenger's backpack.

Eurocopter respectfully requests that the Safety Board modify its probable cause determination and that it remove the statements:

- The loss of engine power due to an overspeed of the helicopter's turbine engine, precipitated by the inadvertent movement of the fuel flow control lever by the passenger.
- Also causal was the manufacturer's design and placement of the fuel control lever which made it susceptible to accidental contact and movement by passengers.
- Contributing to the Accident was the pilot's failure to properly secure/stow the passenger's backpack.

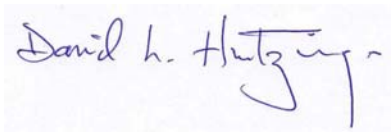
Based on the factual information derived from the investigation, Eurocopter concludes the probable cause of the subject accident was:

- An in-flight main rotor impact with snow-covered terrain, resulting in decoupling between the engine and main rotor system and subsequent loss of main rotor RPM.
- Additionally, a contributing factor may have been reduced visibility and snow at the time of the accident.

Finally, the Eurocopter interests request that the Safety Board include this Petition in the NTSB's public docket. Eurocopter also requests a face to face meeting with NTSB to discuss the facts provided in this petition.

Thank you very much for the opportunity to assist the NTSB with this investigation and for your consideration of this Petition. Please do not hesitate to contact the undersigned if you have any questions concerning this matter.

Sincerely,



David L. Huntzinger
Vice President, Fleet Safety

CC:

Honorable Christopher A. Hart, Vice Chairman, NTSB
490 L'Enfant Plaza, SW
Washington, DC 20594

Honorable Robert L. Sumwalt, Member, NTSB
490 L'Enfant Plaza, SW
Washington, DC 20594

Honorable Mark R. Rosekind, Member, NTSB
490 L'Enfant Plaza, SW
Washington, DC 20594

Honorable Earl F. Weener, Member, NTSB
490 L'Enfant Plaza, SW
Washington, DC 20594

Mr. Tom Hauteur, Director, Office of Aviation Safety, NTSB
490 L'Enfant Plaza, SW
Washington, DC 20594

Mr. Gary Halbert, Esq., General Counsel, NTSB
490 L'Enfant Plaza, SW
Washington, DC 20594

Mr. Jim LaBelle, Alaska Regional Chief, NTSB
222 West 7th Avenue
Room 216, Box 11
Anchorage, Alaska 99513

Mr. Larry Lewis, Investigator in Charge, NTSB
222 West 7th Avenue
Room 216, Box 11
Anchorage, Alaska 99513

Mr. Frederic Aime, Safety Investigator, BEA
Aeroport du Bourget – Batiment 153
93352 Le Bourget Cedex France

Mr. David Keenan, Air Safety Investigator, FAA, AVP-100
800 Independence Ave., SW
Washington, DC 20591

Mr. Michael Newell, Director of Safety, Era Helicopters
P.O. Box 6550
Lake Charles, LA 70606

Mr. Marc Lanusse, Manager, Accident Investigation, Turbomeca
64511 Bordes Cedex—France

Mr. Archie Whitten, Accident Investigator, Turbomeca USA
2709 Forum Drive
Grand Prairie, TX 75052

Mr. Yves Nicolas, Manager, Accident Investigation, Eurocopter
Aeroport de Marseille Provence
Marignane 13725

Mrs. Lindsay Cunningham, Sr. Accident Investigator, American Eurocopter
2701 Forum Drive
Grand Prairie, Texas 75054

List of Appendices:

Appendix 1: Diagram and Photograph of Fuel Flow Control Lever

Appendix 2: 11/30/2009 E-mail Correspondence with NTSB IIC

Appendix 3: American Eurocopter Wreckage Exam Notes

Appendix 4: Eurocopter Comments to NTSB Draft Factual Report

Appendix 5: Engine Manufacturer’s Party Submission

Appendix 6: 2/15/2010 E-Mail Correspondence with NTSB IIC

Appendix 7: NTSB Accident # DEN00FA084 Brief and Probable Cause